



Sustainable Intensification of Cereal-Legume-Livestock Integrated Farming Systems in East and Southern Africa

Introduction

Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) comprises three research for development projects in West Africa, East and Southern Africa, and the Ethiopian highlands. The program is funded by the United States Agency for International Development (USAID) as part of the U.S. government's Feed the Future Initiative.

Africa RISING in East and Southern Africa is being implemented in Tanzania, Malawi, and Zambia. Constraints to agriculture and livestock production in these areas include environmental degradation, poverty, malnutrition, low accessibility to improved seeds and breeds, pests and diseases, weak research-extension-farmer linkages, lack of advanced technologies, conflicts between livestock keepers and farmers, and few market opportunities.

Africa RISING will provide sustainable solutions to these challenges.



Farmers discussing field experiments

Tanzania

Project sites

Babati and Kiteto districts in Manyara region; Kongwa district in Dodoma region

Project interventions

The project is identifying and testing best practices for integrating crops and livestock, land management, and linking farming and marketing to nutrition and health.

These practices comprise of single technologies or varied combinations of:

- High yielding, disease resistant and drought tolerant, multi-purpose, nutritious and marketable food and feed crops including maize, beans, pigeon pea, groundnut, and fodder plants.
- Integrated soil fertility management practices such as efficient application of organic and inorganic fertilizers in the farming systems, and/or integration of legumes in the rotation.
- Postharvest processing, utilization, and nutrition technologies to reduce food loss,

increase shelf life and market value of farm produce. Special focus is being given to ensure food safety by addressing mycotoxin contamination.

- Appropriate land management technologies that conserve water and soil such as rain water harvesting, rain use efficiency, and controlling soil erosion.
- Crop-livestock integration to enhance their productivity through introduction of agroforestry based interventions for fodder and pasture quality management.

Malawi

Project sites

Ntcheu and Dedza districts in central Malawi

Project interventions

Africa RISING aims at enhancing farmers' knowledge and supporting intensification for increased productivity in maize-legume farming systems, beginning with integrating technologies that address soil and land degradation.

The research builds on Michigan State University's past successes of promoting legume-diversified farming systems in northern Malawi through participatory action research using 'mother-baby' adaptive trials as platforms for knowledge dissemination.

Mother trials: Researchers set up 'mother' trials on lead farmers' fields to demonstrate an array of existing technologies and technology combinations for sustainable intensification.

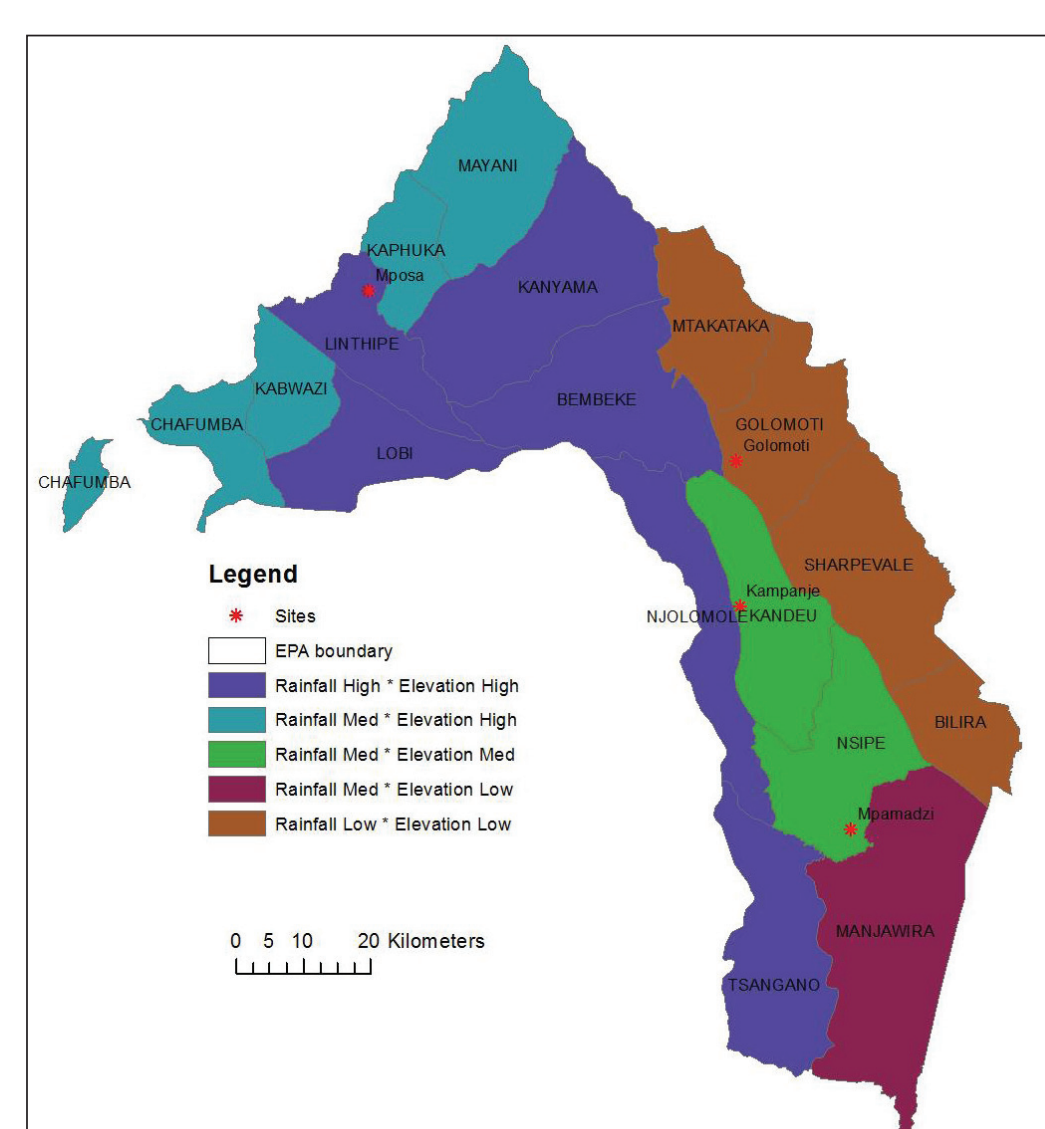
These are:

- Intensified grain legume production as (i) sole crops in rotation with cereals, (ii) various maize/legume intercropping options, (iii) a unique intercropping of two grain legumes based on their complementary growth characteristics and plant architecture. This 'doubled-up legume' technology hinges on pigeon pea's unique growth habit compared to the potential under-storey companion crops (groundnut, soybean, cowpea, beans), which ensures enhanced soil fertility benefits and grain for better nutrition.
- Soil fertility and soil health management through application of organic, inorganic, or a mixture of both fertilizers, use of cover crops and short fallow rotation with green manure.

Adaptive baby trials: Farmers involved in setting up the 'mother' trials select their



Farmer in Babati, Tanzania, testing maize - climbing bean intercropping



Africa RISING Research Action Sites (sections) in Malawi

preferred options and set up 'baby' trials for experimentation on their farms.

Livestock integration and intensification: While the livestock density is very low, the project is exploring options for enhancing productivity among the farmers who own livestock.

Zambia

Project sites

Katete and Chipata districts in Eastern province

Project interventions

Africa RISING has formed a strategic partnership with the SIMLEZA (Sustainable Intensification of Maize-Legume Systems in Eastern province of Zambia) project, led by the International Maize and Wheat Improvement Center (CIMMYT) and the International Institute of Tropical Agriculture (IITA).

The SIMLEZA-Africa RISING research activities aim at:

- Enhancing technology targeting and delivering through improving input and output value chains.
- Enhancing adoption and adaptation of productive and resilient agronomic practices and facilitation of local innovation systems.
- Enhancing the diversification of soybean use at household level through processing and product development.
- Increasing the range of maize and legume varieties through participatory testing, release, and enhanced delivery of seeds of locally adapted varieties.
- Enhancing the capacity of national partners.

Emerging activities

To increase the understanding of the implications of sustainable on-farm intensification at the landscape level the project will provide the evidence base for the links between field- and farm-scale sustainable intensification interventions and climate change mitigation and biodiversity conservation. This work will be carried out in Eastern and Lusaka provinces.

Partners

To implement the Africa RISING East and Southern Africa project, IITA has entered into partnerships with a wide range of individuals and institutions with different expertise.

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